

**5-1 Skills Practice*****Monomials***

Simplify. Assume that no variable equals 0.

1.  $b^4 \cdot b^3$

2.  $c^5 \cdot c^2 \cdot c^2$

3.  $a^{-4} \cdot a^{-3}$

4.  $x^5 \cdot x^{-4} \cdot x$

5.  $(g^4)^2$

6.  $(3u)^3$

7.  $(-x)^4$

8.  $-5(2z)^3$

9.  $-(-3d)^4$

10.  $(-2t^2)^3$

11.  $(-r^7)^3$

12.  $\frac{s^{15}}{s^{12}}$

13.  $\frac{k^9}{k^{10}}$

14.  $(-3f^3g)^3$

15.  $(2x)^2(4y)^2$

16.  $-2gh(g^3h^5)$

17.  $10x^2y^3(10xy^8)$

18.  $\frac{24wz^7}{3w^3z^5}$

19.  $\frac{-6a^4bc^8}{36a^7b^2c}$

20.  $\frac{-10pq^4r}{-5p^3q^2r}$

Express each number in scientific notation.

21. 53,000

22. 0.000248

23. 410,100,000

24. 0.00000805

Evaluate. Express the result in scientific notation.

25.  $(4 \times 10^3)(1.6 \times 10^{-6})$

26.  $\frac{9.6 \times 10^7}{1.5 \times 10^{-3}}$

## 5-2 Practice

### Polynomials

Determine whether each expression is a polynomial. If it is a polynomial, state the degree of the polynomial.

1.  $5x^3 + 2xy^4 + 6xy$

2.  $-\frac{4}{3}ac - a^5d^3$

3.  $\frac{12m^8n^9}{(m-n)^2}$

4.  $25x^3z - x\sqrt{78}$

5.  $6c^{-2} + c - 1$

6.  $\frac{5}{r} + \frac{6}{s}$

Simplify.

7.  $(3n^2 + 1) + (8n^2 - 8)$

8.  $(6w - 11w^2) - (4 + 7w^2)$

9.  $(-6n - 13n^2) + (-3n + 9n^2)$

10.  $(8x^2 - 3x) - (4x^2 + 5x - 3)$

11.  $(5m^2 - 2mp - 6p^2) - (-3m^2 + 5mp + p^2)$

12.  $(2x^2 - xy + y^2) + (-3x^2 + 4xy + 3y^2)$

13.  $(5t - 7) + (2t^2 + 3t + 12)$

14.  $(u - 4) - (6 + 3u^2 - 4u)$

15.  $-9(y^2 - 7w)$

16.  $-9r^4y^2(-3ry^7 + 2r^3y^4 - 8r^{10})$

17.  $-6a^2w(a^3w - aw^4)$

18.  $5a^2w^3(a^2w^6 - 3a^4w^2 + 9aw^6)$

19.  $2x^2(x^2 + xy - 2y^2)$

20.  $-\frac{3}{5}ab^3d^2(-5ab^2d^5 - 5ab)$

21.  $(v^2 - 6)(v^2 + 4)$

22.  $(7a + 9y)(2a - y)$

23.  $(y - 8)^2$

24.  $(x^2 + 5y)^2$

25.  $(5x + 4w)(5x - 4w)$

26.  $(2n^4 - 3)(2n^4 + 3)$

27.  $(w + 2s)(w^2 - 2ws + 4s^2)$

28.  $(x + y)(x^2 - 3xy + 2y^2)$

29. **BANKING** Terry invests \$1500 in two mutual funds. The first year, one fund grows 3.8% and the other grows 6%. Write a polynomial to represent the amount Terry's \$1500 grows to in that year if  $x$  represents the amount he invested in the fund with the lesser growth rate.

30. **GEOMETRY** The area of the base of a rectangular box measures  $2x^2 + 4x - 3$  square units. The height of the box measures  $x$  units. Find a polynomial expression for the volume of the box.

## 5-3

## Practice

## Dividing Polynomials

Simplify.

1.  $\frac{15r^{10} - 5r^8 + 40r^2}{5r^4}$

2.  $\frac{6k^2m - 12k^3m^2 + 9m^3}{2km^2}$

3.  $(-30x^3y + 12x^2y^2 - 18x^2y) \div (-6x^2y)$

4.  $(-6w^3z^4 - 3w^2z^5 + 4w + 5z) \div (2w^2z)$

5.  $(4a^3 - 8a^2 + a^2)(4a)^{-1}$

6.  $(28d^3k^2 + d^2k^2 - 4dk^2)(4dk^2)^{-1}$

7.  $\frac{f^2 + 7f + 10}{f + 2}$

8.  $\frac{2x^2 + 3x - 14}{x - 2}$

9.  $(a^3 - 64) \div (a - 4)$

10.  $(b^3 + 27) \div (b + 3)$

11.  $\frac{2x^3 + 6x + 152}{x + 4}$

12.  $\frac{2x^3 + 4x - 6}{x + 3}$

13.  $(3w^3 + 7w^2 - 4w + 3) \div (w + 3)$

14.  $(6y^4 + 15y^3 - 28y - 6) \div (y + 2)$

15.  $(x^4 - 3x^3 - 11x^2 + 3x + 10) \div (x - 5)$

16.  $(3m^5 + m - 1) \div (m + 1)$

17.  $(x^4 - 3x^3 + 5x - 6)(x + 2)^{-1}$

18.  $(6y^2 - 5y - 15)(2y + 3)^{-1}$

19.  $\frac{4x^2 - 2x + 6}{2x - 3}$

20.  $\frac{6x^2 - x - 7}{3x + 1}$

21.  $(2r^3 + 5r^2 - 2r - 15) \div (2r - 3)$

22.  $(6t^3 + 5t^2 - 2t + 1) \div (3t + 1)$

23.  $\frac{4p^4 - 17p^2 + 14p - 3}{2p - 3}$

24.  $\frac{2h^4 - h^3 + h^2 + h - 3}{h^2 - 1}$

25. **GEOMETRY** The area of a rectangle is  $2x^2 - 11x + 15$  square feet. The length of the rectangle is  $2x - 5$  feet. What is the width of the rectangle?

26. **GEOMETRY** The area of a triangle is  $15x^4 + 3x^3 + 4x^2 - x - 3$  square meters. The length of the base of the triangle is  $6x^2 - 2$  meters. What is the height of the triangle?

